National Institute of Environmental Health Sciences

Heat-health warning systems: A comparison of the predictive capacity of different approaches to identifying dangerously hot days

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Abstract:

Objectives. We compared the ability of several heat-health warning systems to predict days of heat-associated mortality using common data sets. Methods. Heat-health warning systems initiate emergency public health interventions once forecasts have identified weather conditions to breach predetermined trigger levels. We examined 4 commonly used trigger-setting approaches: (1) synoptic classification, (2) epidemiologic assessment of the temperature-mortality relationship, (3) temperature-humidity index, and (4) physiologic classification. We applied each approach in Chicago, Illinois; London, United Kingdom; Madrid, Spain; and Montreal, Canada, to identify days expected to be associated with the highest heat-related mortality. Results. We found little agreement across the approaches in which days were identified as most dangerous. In general, days identified by temperature-mortality assessment were associated with the highest excess mortality. Conclusions. Triggering of alert days and ultimately the initiation of emergency responses by a heat-health warning system varies significantly across approaches adopted to establish triggers.

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Resource Description

Early Warning System: ☒

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

A focus of content

Exposure : ☒

weather or climate related pathway by which climate change affects health

Meteorological Factors, Meteorological Factors, Meteorological Factors, Temperature, Other Exposure

Temperature: Extreme Heat

Other Exposure: dew point; cloud cover; synoptic classification; temperature-humidity index

Geographic Feature: ☒

resource focuses on specific type of geography

Urban

Geographic Location: ☑

resource focuses on specific location

Global or Unspecified

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Morbidity/Mortality

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

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